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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,047	09/18/2006	Lucille Beaudet	NEN-22402/16	6066

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EXAMINER	
XU, XIAOYUN	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
12/21/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,047	BEAUDET ET AL.	
	Examiner	Art Unit	
	ROBERT XU	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,9,11,12,14-16,18-25 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-7, 9, 11, 12, 14-16, 18-25 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 12/08/2009 has been entered and fully considered. Claims 2, 8, 10, 13, 17 and 26 are canceled. Claims 1, 3-7, 9, 11, 12, 14-16, 18-25 and 27 are pending, of which Claims 1, 9, 12, 16 and 25 are amended.

Response to Amendment

2. In response to amendment, the examiner modifies rejection over the prior art established in the previous Office action.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1, 3, 4, 6, 7, 9, 11, 12, 14-16, 18 and 20-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Franks (US 4,359,641, IDS) Costa (US 4,692,266), and Puseljic (IEEEE Transaction of Nuclear Science, 1990)

In regard to Claims 1, 3, 16 and 18, Franks teaches a multicomponent scintillation medium that comprises a first scintillator material, wherein the first scintillator material is a scintillation fluorescent Coumarin dye (Coumarin 540) (see Col. 6, line 19-26, Table 1). Franks teaches that the fluorescent emission of the first scintillator material (Coumarin 540 with a pseudo-cumene as a solvent) has a fluorescent emission of 485 nm (see Table 1, lines 9). Even if the solid state fluorescence emission of Coumarin 540 were outside the range of 460-500 nm, this difference would not be significant enough to make the instant claims patentably distinguishable from Franks, because the emission wavelength is an inherent property of the compound.

Franks is silent on the value of the Stokes shift of Coumarin 540. However, the Stokes shift is an inherent property of Coumarin 540. Puseljic teaches that Coumarin 540 has a Stokes Shift of 125 nm (see Table 2).

Franks dose not teach that the first scintillator is incorporated in a solid polymer material. The use of solid polymers having Coumarin dye incorporated therein is well known in the art. For example, Costa teaches using solid polymer to hold Coumarin dyes (see Col. 6, lines 44-57).

Costa further teaches that such a composition has a high counting efficiency, even for liquids which do not swell, dissolve, or penetrate the polymer (see col. 3, lines 1-3). At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the solid polymer as taught by Costa to hold Coumarin because this would provide high counting efficiency.

In regard to Claims 9 and 11, Franks teaches a method of detecting and measuring radiation (see Col. 6, line 40-45). The method comprises the steps of:

providing a scintillations medium which comprising a solid body (a vessel) which contains a first scintillator material, Coumarin 540 (see col. 6, line 41-45). The fluorescent emission of the first scintillator material (Coumarin 540 with a pseudo-cumene as a solvent) has a fluorescent emission of 485 nm (see Table 1, lines 9).

contacting the scintillation medium with an radionuclide analyte (see col. 6, lines 40-45); and

detecting any scintillation caused in the medium (see Figure 1).

Franks does not teach the value of Stokes shift of Coumarin 540. However, the Stokes shift is an inherent property of Coumarin 540. Puseljic teaches that Coumarin 540 has a Stokes Shift of 125 nm (see Table 2).

In regard to Claims 4, 14, 15, 20 and 21, Franks teaches that the scintillation medium further includes a second scintillator, BiBuQ. Franks further teaches that the role of BiBuQ in this system is to increase energy transfer efficiency from the pseudo-cumene to the Coumarin 540-A (see Col. 6, lines 19-21).

In regard to Claims 6, 7 and 22 Franks includes BiBuQ as second scintillator material. Franks does not teach using solid polymer bead to hold Coumarin dyes. The use of solid polymers bead having Coumarin dye incorporated therein is well known in the art. For example, Costa teaches using polymer to hold Coumarin dyes to form a coating on a solid support (see Col. 6, lines 44-57, 65-68). Costa further teaches that the support can be omitted if the coating is self-supporting (see col. 7, lines 1-2). A solid polymer bead is self supporting. Costa teaches that the polymeric material bonds the scintillator particles into a coherent but porous bead (structure) (see Col. 3, lines 31-43). At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the solid polymer beads to hold Coumarin and BiBuQ dyes taught

by Costa in Franks' method with reasonable expectation that this would make the scintillator dye easier to use.

In rear to Claim 12, as has been discussed in regard to Claim 6, Costa teaches that the solid body is a polymer bead. Franks teaches that the solid body is a vessel for retaining a liquid scintillation (see col. 6, lines 40-45).

In regard to Claim 23, Costa teaches that the polymeric material structure is sufficiently porous that can hold at least 50% volume of liquid (see Col. 3, line lines 31-43).

In regard to Claim 24, Costa teaches applying the scintillator composition coating to a surface of a sampling tray in a Packard Tri-Carb Liquid Scintillation Counter (see Col. 7, line 56-62). The sampling tray in Tri-Carb Liquid Scintillation Counter is known in the art to be configured to retain liquid samples.

5. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Franks in view of Costa and Puseljic as applied to Claims 1, 3 and 4 above, and further in view of Birks (British Journal of Applied Physics, 1963).

In regard to Claim 5, Franks teaches using a second scintillator material, BiBuQ, to increase energy transfer efficiency from the solvent to Coumarin (see Col. 6, lines 19-21). Franks does not teach using PPO or DPA as a secondary scintillator material. However, PPO and DPA are known scintillator materials. For example, Birks teaches using PPO and DPA as scintillator material (see abstract). Simple substitution of one known element for another to obtain predictable results is obvious according to recent Supreme Court ruling. [see KSR International Co. v. Teleflex Inc., 550 U.S. , 82 USPQ2d 1385, 1395-97 (2007)] (see MPEP 2143). Because BiBuQ, PPO and DPA are known scintillator materials, therefore, simple substitution of one known element (BiBuQ) for another (PPO or DPA) to obtain predictable results (to increase energy transfer efficiency from the solvent to Coumarin as taught by Franks) is obvious to one of ordinary skill in the art at the time of the invention.

6. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Franks in view of Costa and Puseljic as applied to Claim 16 above, and further in view of Harrah (US 4,594,179).

In regard to Claim 19, Franks teaches using Coumarin 540 as Coumarin dye. Franks does not teach using Coumarin 153 or Coumarin 152 as Coumarin dye. However, Coumarin 153 and Coumarin 152 are known Coumarin dyes with similar emission wavelength and Stokes shifts.

For example, Harrah teaches Coumarin 153 is a scintillator with emission wavelength of about 484 nm and Stokes shift of about 135 nm (see Col. 7, lines 61-68). Simple substitution of one known element for another to obtain predictable results is obvious according to recent Supreme Court ruling. [see *KSR International Co. v. Teleflex Inc.*, 550 U.S. , 82 USPQ2d 1385, 1395-97 (2007)]. Because Coumarin 540 and Coumarin 153 are known scintillators with similar emission wavelengths and Stokes shifts, therefore, simple substitution of one known element (Coumarin 540) for another (Coumarin 135) to obtain predictable results (to convert radiation into fluorescent emission) is obvious to one of ordinary skill in the art at the time of the invention.

7. **Claims 25 and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Franks in view of Birks (British Journal of Applied Physics, 1963) and as further evidenced by Puseljic.

In regard to Claims 25 and 27, as has been discussed in respect to Claim 5 above, combined teaching of Franks and Birks teaches a liquid scintillation cocktail comprising Coumarin dye as first scintillator material and PPO or DPA as second scintillator material. Franks further teaches that the medium comprises pseudo-cumene as a solvent having Coumarin 540 dissolved therein (see Col. 3, lines 56-58). Franks does not teach the value of Stokes shift of Coumarin 540. However, the Stokes shift is an inherent property of Coumarin 540. Puseljic teaches that Coumarin 540 has a Stokes Shift of 125 nm (see Table 2).

Franks teaches that the fluorescent emission of the first scintillator material (Coumarin 540 with a pseudo-cumene as a solvent) has a fluorescent emission of 485 nm (see Table 1, lines 9).

Response to Arguments

8. Applicant's arguments filed 12/08/2009 have been fully considered but they are not persuasive.

Firstly, although Franks does not teach solid state member for a scintillation proximity assay, Costa teaches using polymer to hold Coumarin dyes to form a coating on a solid support (see Col. 6, lines 44-57, 65-68). Costa further teaches that the support can be omitted if the coating is self-supporting (see col. 7, lines 1-2). A solid polymer bead is self supporting. Costa teaches that the polymeric material bonds the scintillator particles into a coherent but porous bead (structure) (see Col. 3, lines 31-43). Costa further teaches that such a composition has a

high counting efficiency, even for liquids which do not swell, dissolve, or penetrate the polymer (see col. 3, lines 1-3). At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the solid polymer as taught by Costa to hold Coumarin because this would provide high counting efficiency.

Secondly, Franks teaches that the fluorescent emission of the first scintillator material (Coumarin 540 with a pseudo-cumene as a solvent) has a fluorescent emission of 485 nm (see Table 1, lines 9). 485 nm is within the range of 460-500 nm. Even if the solid state fluorescence emission of Coumarin 540 were outside the range of 460-500 nm, this difference would not be significant enough to make the instant claims patentably distinguishable from Franks, because the wavelength of the emission is the inherent property of the compound.

Harrah teaches that Coumarin 153 is a scintillator with emission wavelength of about 484 nm and Stokes shift of about 135 nm (see Col. 7, lines 61-68). Since Coumarin 153 is recited in Claim 19, its solid state fluorescence emission should be in the range of 460-500 nm, because the wavelength of the emission is inherent property of the compound.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT XU whose telephone number is (571)270-5560. The examiner can normally be reached on Mon-Thur 7:30am-5:00pm, Fri 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12/17/2009

/Yelena G. Gakh/
Primary Examiner, Art Unit 1797

RX